

## Bochang Moon

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Assistant Professor

School of Integrated Technology at Gwangju Institute of Science and Technology (GIST)

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### Education

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- **Ph.D.** in Computer Science, KAIST, Korea Feb. 2010 – Aug. 2014  
Thesis: Acceleration Techniques for Monte Carlo Ray Tracing  
Advisor: Sung-Eui Yoon
- **M.S.** in Computer Science at KAIST, Korea Feb. 2008 – Jan. 2010  
Thesis: Cache-Oblivious Ray Reordering  
Advisor: Sung-Eui Yoon
- **B.S.** in Computer Science at Chung-Ang university, Korea Mar. 2004 – Feb. 2008  
Graduated top of the college of engineering (GPA: 4.35/4.50)

### Professional Experience

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- **Assistant Professor**, Gwangju Institute of Science and Technology Sep. 2016 - present
- **Post Doc**, Disney Research Zürich (based on Edinburgh) Nov. 2014 – July 2016
- **Post Doc**, Dept. of Computer Science, KAIST Sep. 2014 – Oct. 2014
- **Research Intern**, Adobe, US Jun. 2011 – Sep. 2011
- **Research Assistant**, Scalable Graphics/Geometric Algorithm Lab., KAIST Feb. 2008 – Aug. 2014
- **Teaching Assistant**, Dept. of Computer Science, KAIST Feb. 2009 – Jan. 2011

### Research Interests

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- Denoising
- Cache-coherent algorithms for ray tracing
- Sampling and reconstruction for Monte Carlo ray tracing
- Photorealistic rendering for augmented and virtual reality

### Awards

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- Significant New Researcher Award at Korea Computer Graphics Society 2014
- 3<sup>rd</sup> place at ACM Student Research Competition (SRC) Grand Finals held at ACM Awards Banquet

1<sup>st</sup> place at ACM SRC held at ACM SIGGRAPH 2009

RACBVHs: Random-Accessible Compressed Bounding Volume Hierarchies

Tae-Joon Kim, [Bochang Moon](#), Duksu Kim, Sung-Eui Yoon

## Publications (International Conference / Journal papers)

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### 1. Noise Reduction on G-Buffers for Monte Carlo Filtering

[Bochang Moon](#), Jose A Iglesias-Guitian, Steven McDonagh, Kenny Mitchell

*Computer Graphics Forum (Presented at Eurographics Symposium on Rendering 2017), 2017*

### 2. Pixel History Linear Models for Real-Time Temporal Filtering

Jose A Iglesias-Guitian, [Bochang Moon](#), Charalampos Koniaris, Eric Smolikowski, Kenny Mitchell

*Computer Graphics Forum (Proceedings of Pacific Graphics 2016), vol. 35, no. 7, pp. 363-372, Oct. 2016*

### 3. Nonlinearly Weighted First-order Regression for Denoising Monte Carlo Renderings

Benedikt Bitterli, Fabrice Rousselle, [Bochang Moon](#), Jose A. Iglesias-Guitian, David Adler, Kenny Mitchell, Wojciech Jarosz, Jan Novak

*Computer Graphics Forum (Proceedings of Eurographics Symposium on Rendering 2016), vol. 35, no. 4, July 2016*

### 4. User, Metric, and Computational Evaluation of Foveated Rendering Methods

Nicholas T. Swafford, Charalampos Koniaris, Jose A. Iglesias-Guitian, [Bochang Moon](#), Darren Cosker, Kenny Mitchell

*Proceedings of ACM Symposium on Applied Perception, July 2016*

### 5. Adaptive polynomial rendering

[Bochang Moon](#), Steven McDonagh, Kenny Mitchell, Markus Gross

*ACM Transactions on Graphics (Proceedings of SIGGRAPH 2016), vol. 35, no. 4, pp. 40:1-40:10, July 2016*

### 6. Adaptive rendering with linear predictions

[Bochang Moon](#), Jose A. Iglesias-Guitian, Sung-Eui Yoon, Kenny Mitchell

*ACM Transactions on Graphics (Proceedings of SIGGRAPH 2015), vol. 34, no. 4, pp. 121:1-121:11, Aug. 2015*

### 7. Recent advances in adaptive sampling and reconstruction for Monte Carlo rendering

Matthias Zwicker, Wojciech Jarosz, Jaakko Lehtinen, [Bochang Moon](#), Ravi Ramamoorthi, Fabrice Rousselle, Pradeep Sen, Cyril Soler, Sung-Eui Yoon

*Computer Graphics Forum (Proceedings of Eurographics 2015), vol. 34, no. 2, pp. 667-681, May 2015*

### 8. Adaptive rendering based on weighted local regression

[Bochang Moon](#), Nathan Carr, Sung-Eui Yoon

*ACM Transactions on Graphics (Presented at SIGGRAPH 2015), vol. 33, no. 5, pp. 170:1-170:14, Aug. 2014*

### 9. P-RPF: pixel-based random parameter filtering for Monte Carlo rendering

Hyosub Park, [Bochang Moon](#), Soomin Kim, Sung-Eui Yoon

*Proceedings of Computer-Aided Design and Computer Graphics (CAD/Graphics), pp. 123 - 130, Nov. 2013*

### 10. Robust image denoising using a virtual flash image for Monte Carlo ray tracing

[Bochang Moon](#), Jong Yun Jun, JongHyeob Lee, Kunho Kim, Toshiya Hachisuka, Sung-Eui Yoon

*Computer Graphics Forum (Presented at Eurographics Symposium on Rendering 2014), vol. 32, No. 1, pp. 139-151, Feb. 2013*

### 11. Cache-oblivious ray reordering

[Bochang Moon](#), Youngyong Byun, Tae-Joon Kim, Pio Claudio, Hye-sun Kim, Yun-ji Ban, Seung Woo Nam, Sung-Eui Yoon  
*ACM Transactions on Graphics (Presented at SIGGRAPH 2011)*, vol. 29, no. 3, pp. 28:1-28:10, June 2010

**12. HCCMeshes: hierarchical-culling oriented compact meshes**

Tae-Joon Kim, Yongyoung Byun, Yongjin Kim, [Bochang Moon](#), Seungyong Lee, Sung-Eui Yoon  
*Computer Graphics Forum (Proceedings of Eurographics 2010)*, vol. 29, no. 2, pp. 299-308, May 2010

**13. RACBVHs: random-accessible compressed bounding volume hierarchies**

Tae-Joon Kim, [Bochang Moon](#), Duksu Kim, Sung-Eui Yoon  
*IEEE Transactions on Visualization and Computer Graphics*, vol. 16, no. 2, pp. 273-286, Mar. 2010

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**Presentations (Short Papers/Posters/Exhibitions)**

**1. Interactive Ray-Traced Area Lighting with Adaptive Polynomial Filtering**

Jose A. Iglesias Guitian, [Bochang Moon](#), Kenny Mitchell  
The 13th European Conference on Visual Media Production (CVMP), London, 2016

**2. IRIDiuM: Immersive Rendered Interactive Deep Media**

Babis Koniaris, Maggie Kosek, Ivan Huerta, Karen Darragh, Charles Malleson, Joanna Jamroz, Nick Swafford, Jose A. Iglesias Guitian, [Bochang Moon](#), Ali Israr, Kenny Mitchell  
VR Village in SIGGRAPH 2016

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**Domestic Publications**

**1. SURE-based-Trous Wavelet Filter for Interactive Monte Carlo Rendering**

Soomin Kim, [Bochang Moon](#), Sung-Eui Yoon  
*Journal of KIISE*, vol. 43, no. 8, pp. 835-840, Aug. 2016

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**Invited Talks**

**1. Local Regression based Denoising for Ray Tracing**

- a. Korea Computer Graphics Society, July 12, 2017
- b. KwangWoon University, Mar. 16, 2017
- c. KAIST, Aug. 16, 2016

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**Patents**

**1. Adaptive sampling guided by multilateral filtering**

[Bochang Moon](#), Nathan Carr  
Registration #: 08824834, US, 02 Sep. 2014

**2. Method for removing image noise on basis of stochastic rendering**

Sung-Eui Yoon, [Bochang Moon](#), Kunho Kim, Jong Yun Jun, Jong Hyeob Lee  
Publication #: WO/2013/137522, PCT, 19 Sep. 2013

**3. Noise reduction method for stochastic rendering image**

Sung-Eui Yoon, [Bochang Moon](#), Kunho Kim, Jong Yun Jun, Jong Hyeob Lee

Registration #: 1012827000000, Korea, 01 July 2013

## Professional Activities

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- Associate Editor
  - Visual Computer, Sep. 2016 - present
- Program Committee
  - EGSR 2017, KCGS 2017
- Reviewer
  - ACM SIGGRAPH, ACM SIGGRAPH ASIA, ACM Transactions on Graphics, IEEE TVCG, Pacific Graphics, Visual Computer, ACM TOPLAS, ETC.

## Press Release

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- “Disney Research rendering method preserves detail in film quality production graphics”
  - Phys, Aug. 5, 2015, <http://phys.org/news/2015-08-team-method-quality-production-graphics.html>
- “Adaptive rendering method reduces discolored pixels in photo-realistic images”
  - Phys, July 20, 2016, <https://phys.org/news/2016-07-method-discolored-pixels-photo-realistic-images.html>

## Research Grants

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1. Developed intelligent UXUI technology for AR glasses-based docent operation
  - 2017.04-2017.12.31, MCST, 30M won (\$30K)
2. 3D Indoor Reconstruction and Its Applications
  - 2017.05-2017.12, PI, GIST, approximately 60M won (\$60K)
3. Denoising for Physically based Rendering
  - 2017.03 – 2019.02, PI, NRF, 225M won (\$225K)
4. Denoising Techniques for Monte Carlo Ray Tracing
  - 2016.09 – 2016.12, PI, GIST, 19M won (\$19K)
5. Optimization Techniques for Photorealistic Rendering
  - 2016.09 – 2018.08, PI, GIST seed grant, 70M won (\$70K)
6. Startup funding
  - 2016.09 – 2017.12, PI, GIST seed grant, 130M won (\$130K)

## Teaching

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1. Introduction to Computer Graphics
  - Spring 2017
2. Photorealistic Rendering
  - Fall 2017

### Supervised Students

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- Ph.D. Course
- M.S./Ph.D. Integrated Course
  - Piljoon Jeong (정필중, 2017.09 – present)
- M.S. Course
  - Saerom Ha (하새롬, 2017.03 – present), Sojin Oh (오소진, 2017.08 – present), Prajita Mane (2017.09 - present)
- Intern
  - Sunhwa Kim (김선화, 2017.02), Jae-Yee Kim (김재이, 2017.07-2017.08)

### Dissertation Committee for M.S. and Ph.D. Students

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- MS committee
  - Yonghoon Kwon (권용훈, advisor: Kuk-Jin Koon, 2017.06), Yunjeong Choi (최윤정, advisor: Jeha Ryu, 2016.12), Jae-Won Ye (예재원, advisor: Kuk-Jin Yoon, 2016.12)